Appendix - Spanning the Boundaries of Data Visualization Work: An Exploration of Functional Affordances and Disciplinary Values

Jaime Snyder[1] and Katie Shilton[2]

[1] University of Washington, Seattle WA 98195, USA
`jas1208@uw.edu`
[2] University of Maryland, College Park MD 20742, USA
`kshilton@umd.edu`

Table 1. Summary of R and Illustrator characteristics.

	R	Adobe Illustrator
Licensing Model	GNU General Public License	Monthly licensing fee
Launched	1997	1986
Description	Software environment for statistical and graphical techniques	Vector graphics software application with scripting
Support & maintenance	R Foundation for Statistical Computing	Adobe
Primary Audience	Statisticians and data scientists	Graphic designers and artists
Purpose	Data manipulation, calculation and graphical display Developing statistical software	Creation of scalable vector graphics for use in print and digital production Setting digital type
Extensibility	Community developed external packages and libraries	Suite of compatible products: photo/video editing, desktop publishing, web development

Table 2. Data Visualization Functionality.

	R	Adobe Illustrator
Purpose of graphic functionality	Uses structural rules for the representation of data; produces standardized output	Gives users creative and artistic control; ensures scalability through vector-based output
How are data entered/imported?	Via vectors and dataframe	Via a spreadsheet-like tool window
Graphic output	Plots exported as PDF	Charts generated as vector graphics or groups of vector objects
Design patterns	Seven base graphs, selected by calling specific functions in the code. ggplot2 includes	Nine templates that can be selected via a GUI

	functions for approximately 20 types of plots.	
Manipulation of aesthetics and layout	Aesthetic specifications within the base graphic functions	Standard AI tool box (select tool, color picker, type tool, etc.)
Data visualization functionality	The grid package provides the basis for ggplot2	Graph creation tools

Table 3. Development of data visualization functionality over time: Black = Core functionality; Medium Grey = Secondary functionality (through packages or special tools); Light Grey = Emerging, limited or experimental functionality; White = No related functionality.

	R		Adobe Illustrator	
	1997	2018	1986	2018
Acquire	White	White	White	White
Parse	Dark Grey	Dark Grey	White	Light Grey
Filter	Dark Grey	Dark Grey	White	Light Grey
Mine	Dark Grey	Dark Grey	White	Light Grey
Represent	White	Medium Grey	White	Dark Grey
Refine	White	Medium Grey	Dark Grey	Dark Grey
Interact	White	Light Grey	White	Light Grey